# PUBLIC HEALTH

LONDON: THE SOCIETY OF MEDICAL OFFICERS OF HEALTH Tavistock House South, Tavistock Square, W.C.1



No. 6.-Vol. LXVIII.

MONTHLY PRICE 2s. 6d. ANNUAL SUBSCRIPTION 81s. 6d.

**MARCH-1955** 

tion about the film "Simple Nutrition" will

Optimum/Nutrition

Although severe malnutrition is now seldom seen in this country there are undoubtedly certain groups whose nutritional standard is low and whose general health could be improved with a better diet. Good nutrition is specially important during pregnancy, when a sufficient quantity of the protective foods should be ensured.

The protective foods are more often neglected than the other foods by those whose diet is not based on sound principles. Marmite, a protective food supplying the B<sub>2</sub> vitamins, is a concentrated yeast extract which is economical as a dietary source of these vitamins. A special pack is available for distribution at welfare centres, where advice on nutrition is often given.

# MARMITE

yeast extract

contains

RIBOFLAVIN (vitamin B<sub>3</sub>) 1.5 mg. per oz.
NIACIN (nicotinic acid) 16.5 mg. per oz.
Obtainable from chemists and grocers
Special terms for packs for hospitals, welfare centres, and schools The Marmite Food Extract Co., Ltd., 35, Seething Lane,

PH 5306

## BREAST FEEDING CHARTS

are now available dealing with the contemporary theory and practice of breast feeding. A useful aid in teaching nurses, midwives, health visitors and mothers, each set consists of thirteen 2-colour charts, 20" × 30", on thick paper.

PRICE PER SET £4. 0. 0d.

(Subscribers £3. 0. 0d.)

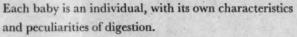
further details from

CENTRAL COUNCIL FOR HEALTH EDUCATION

TAVISTOCK HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1,



# Complete Protection



For this reason, Cow & Gate, in over 50 years of research, have built up a range of foods to deal with practically every feeding problem.

If one of your youngest patients is failing to thrive, chances are that one of our products will solve your difficulty.

Full details of all our products with analyses and indications for use are given in our Medical Handbook obtainable from the Medical & Research Dept., Cow & Gate, Guildford, on request.



# **COW & GATE MILK FOODS**

Guildford

Surrey



## The Disease Man Abolished

"... for the prevention of cholera ... the one real and sufficient protection lies in a standing condition of good sanitation, backed by an efficient and vigilant sanitary administration ..." Encyclopædia Britannica article, "Cholera".

Gutters a century ago were full of filth that could seep into water supplies. Not surprisingly, the fever hospitals too were often crammed with dying people. There were over 20,000 deaths from cholera alone in 1854. Yet in Britain to-day this disease is almost a medical curiosity.

Sanitation has indeed been a silent revolution of our times. Skilled men, using every resource from dustbin to microscope have wrought this dramatic change. For sixty years they have had in Izal a germicide of outstanding reliability, generally regarded nowadays as the standard by which other disinfectants are judged.

Izal Germicide is 18-20 times as powerful as pure phenol, by the

Rideal-Walker test. It is also much less toxic to man than disinfectants made from phenol and cresols. Being highly concentrated, it is easily transported and stored. Even when diluted 600 times, it will kill typhoid germs in three minutes.

Izal Germicide is prepared by Newton Chambers under the close control of bacteriologists and chemists, whose professional skill is the public's ultimate safeguard.



NEWTON CHAMBERS & COMPANY LIMITED, THORNCLIFFE, SHEFFIELD



# TRIBUTE OF THE NILE

Man's need for a good, reliable supply of water has more than once altered the course of history. When rainwater became scarce in what is now the Libyan desert, the primitive inhabitants migrated into the valley of the Nile and laid the foundations of one of the world's most notable civilisations—that of Ancient Egypt. True to the pattern of all early societies, planned and communal action for the distribution of water in Ancient Egypt was undertaken, not to provide supplies for domestic use, but for agricultural purposes. Irrigation channels, leading from the river banks, were constructed and, since these ran through the holdings of many different cultivators, the success of the system depended on the maintenance of a fair code of conduct. Indeed, one of the 'confessions' to be made by the dead before the Judges of the

Underworld was a declaration that they had not cut off or interfered with their neighbours' water supply.

Several ancient writers have described a great reservoir. known as Lake Moeris in the Fayoum and built by the Egyptians around 2300 B.C., whose function was to regulate the Nile floods. According to the Greek historian Herodotus, Lake Moeris received waters from the Nile for six months and for another six sent them back. It had a circumference of 150 miles, an area of 750 square miles and a capacity of 50,000 million cubic meters. It was also said to have regulators at both ends to control the in-flow and out-flow. Lake Moeris no longer exists, and its complete disappearance is one of the mysteries of history—leading some to doubt its existence.

For advice on water sterilization consult:

IMPERIAL CHEMICAL INDUSTRIES LIMITED, LONDON, S.W.I



# PUBLIC HEALTH

OFFICIAL JOURNAL OF THE

#### SOCIETY OF MEDICAL OFFICERS OF HEALTH

Telephone: EUSton 3923 TAVISTOCK HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1 Telegrams: Epidauros, Westcent

No. 6. Vol. LXVIII MARCH, 1955

#### CONTENTS EDITORIAL NEWS AND REPORTS The Study of Health 88 Local Population Estimates for 1954 Measuring the School Child 83 SOCIETY OF MEDICAL OFFICERS OF HEALTH Ordinary Meeting: November Annual General Meeting SPECIAL ARTICLES Personal Findings of School Medical Inspection. By W. J. Pierce, East Anglian Branch Midland Branch Maternity and Child Welfare Group The Prevention of Poliomyelitis. By D. H. Geffen, O.B.E., M.D., D.P.H. 87 Services Group .. .. 94

#### **EDITORIAL**

#### The Study of Health

It is refreshing to find increasingly in the literature articles and reports on discussions on the assessment of health. Not only do we find workers in the local authorities' health services who are engaged in the promotion of health searching for the touchstone for this measurement but also hospital paediatricians. We have also had the American book "The Epidemiology of Health" brought to our notice with high praise.

There is now before us a report\* which tries to elucidate the factors which might be regarded as enhancing or contributing to the health of a group of school children. The investigation was carried out by the Kent Paediatric Society through a small Research Sub-Committee (chairman, Dr. John Landon, M.O.H. of Bexley) and dedicated to Prof. J. A. Ryle who inspired the enquiry. It has taken four years and a few years ago when we received a message from one of the members that the enquiry was directed to the "incidence and causation of health" among 10 to 11 year old children, our interest was keenly aroused. We now know that this group of children in Bexley numbering 1,064 formed the sample.

These are then the several stages of the Study. The school doctors assessed the physical status and a marking form was devised which allowed for deductions from a possible 100 for each defect discovered. These deductions, of course, were arbitrary, but in this way a comparison could be made of the relative physical state of the group. Any child whose deductions were 11 or more marks was excluded from the category of healthy children. In addition to the physical examination each child was subject to mass miniature radiography.

The investigators thought that there was a need to discover some positive index of physical efficiency and each child with a basic score of 90 to 100 was given endurance tests. These consisted of the hanging bar which was used as an elimination test and a dynamometer test—most ingeniously fashioned—to those who were successful. Upgrading marks were then awarded to those whose performance was above the average and it was possible for a child to score up to 25 additional marks.

Assessment of mental (i.e., intellectual) status was carried out on the basis of a group intelligence test. No child with a standard score of less than 95 was retained in the ranks of

the healthy. Here also a system of upgrading marks to a maximum of 25 was evolved. The method selected for the assessment of "mental health," which is interpreted in this survey as "soundness of personality," was the Rorschach Test. A large section of the report is devoted to the description of the test and the special technique employed. Accordingly it is worth while looking at the results, especially as these played an important part in the final assessment. As individual assessment of each result is too lengthy a procedure and group tests are too impersonal, a half-way procedure was adopted, and the answers were grouped in six "constellations" of factors. These constellations stood for :- Co-operation, maturity, imagination, reality sense, social sense and balance. Ingenious "personality-profiles" looking like chess boards, were devised to display results in diagram form for each individual. The results were that 285 or 61.7% of the total showed complete absence of pathological marks and only nine or 1.9% showed three of these marks as against 138, or 29%, scoring one bad mark indicating mild disturbance only. Given the difficulty and vagueness in estimating the percentage of children in a school population who may be considered "disturbed" or "maladjusted," these figures are interesting. The conclusion was that 69 or 15% could be considered to have "failed" on the Rorschach estimate, and these were not retained in the ranks of the healthy. In order to check the validity of the method adopted, which was an indicator of "disturbance," 62 of them were interviewed with their parents and 52% failed also at the interview. The final conclusion was, therefore, that 93% had a satisfactory personality and 7% failed on account of maladjustment.

Now there are many psychologists who deny the accuracy of the Rorschach Test and prefer, say, the Thematic Apperception, but the former has now a respectable history behind it and an undoubted value—if used by the right people. Dr. Wellisch was one of the foremost experts in its use, and also an experienced and wise psychiatrist. We should, therefore, respect these findings, and can admire the ingenuity with which it was presented and scored. Here again upgrading marks were given to a maximum of 25. Some will say that the test is too subjective to be capable of statistical validation, and that a whole battery of tests given by psychologists would alone suffice. This is a debatable point, but if one comprehensive diagnostic test of personality was to be used, the Rorschach method was probably the best one to chose.

the Rorschach method was probably the best one to chose.

The children were divided into "Honours," "Pass" and "Fail" groups according to arbitrary standards based on the total scores, so completing the first part of the investigation into the "incidence" of health.

The second part of the study was concerned with the

<sup>\*</sup>A Study in the Epidemiology of Health: The Kent Paediatric Society. (pp. 88. Price 10s. 6d., plus 6d. postage). Obtainable from the Health Department, 14, Brampton Road, Bexleyheath, Kent.

"causation" of health. It was assumed that the causes of health might be expected to fall into four main categories, namely, genetic, social, economic and cultural. Accordingly a questionnaire running into 12 pages of typescript was used in which a large number of the possible causes of health was set out. The questionnaire was completed at a personal

interview with both parents.

We can now look at the results. All the 1,064 children were given the physical examination and the intelligence test, but 293 parents did not give the consent for the remainder of the investigation. After careful investigation, the remaining 771 children were thought possibly still to be typical of the "working universe." According to the arbitrary scoring, a final grouping showed that 65 children (9·18%) fell into the "honours" group, the "pass" group numbered 345 (48·73%) and the "fail" group 298 (42·09%). There were 63 children who were unavoidably prevented from taking one or more tests and were therefore excluded from the group.

Let us examine briefly the "honours" group which obviously sets a high standard, as indicative of the "incidence" of health. The physical examination was seemingly planned to obtain an objective score (for example no attempt was made to score "nutrition" or "general condition"). It is of some interest, therefore, to note that only 34 children retained full marks, whilst 20 retained 95 or less and two

retained only 90 marks.

Commenting on the endurance test, the authors state that the results came as a surprise. Only 19 children showed a performance which entitled them to upgrading marks at all, whilst 10 children would not have come into the "honours" group had they not scored high marks in the endurance test. We well remember Dr. Marcus Milligan's work on this subject and we recall one of his last lectures in this connection to members of the Society at Leeds. Yet there has been little corroboration since and the present analysis would not appear to encourage the further pursuit. It would be difficult to parcel out the many variables which enter into the performance of these tests.

In the intelligence ratings only six children in the "honours" group scored the maximum upgrading marks of 25. Thirteen scored no upgrading marks at all and 28 scored only five. On the other hand, this group was distinguished by a uniformly high upgrading for personality. Thirty children scored the highest marks and only three received no upgrading for personality. All three entered this group by reason of high score in the endurance test and two of them had the highest possible rating for physical status. It was noticed that a high score for personality was not, necessarily, accompanied by an equivalent rating for intelligence. Attention is drawn to the fact that personality was the deciding factor for entry into the "honours" group.

The authors do not claim that statistical significances obtained from the transcription of the answers to the questionnaires have established causative factors of health, but suggest that they may be pointers. Of the 64 items 12 showed a statistically significant difference between groups at the conventional level. Amongst these were birth-weight, antenatal care, hours of sleep, the density of the household,

heredity and discipline.

Obviously an investigation of this wide range would prove generally too laborious for doctors engaged in a full time job but there are indications of associations which can be looked for and assessed—even if not mathematically—during medical inspections. It is interesting to note in this connection the study which is being carried out at the University of Aberdeen.

The investigation is most refreshing, an oasis in an arid desert of medical schedules. As a tribute to the enthusiasm, skill and labour of the Kent group we hope that the Report will be widely studied, and will stimulate others to investigate the problems associated with health.

#### Measuring the School Child

"Is he the right weight for his age?" is a question which welfare centre and school medical officers are re-

peatedly asked by anxious mothers. Some doctors may answer in accordance with the child's apparent fatness or thinness, others will refer carefully to tables of weights and heights before trying to answer. The cautious doctor will hastily sum up in his own mind the innumerable factors that must be taken into account before determining a child's physique at a given age for a given height for a given type of build, and so forth; he will then probably hedge, mumbling something to the effect that weight is not everything. For years children have defied efforts to make them keep within certain lines of weights and heights. Healthy children may remain unashamedly well below the ninth decile and refuse to pass into anything like a decline, and toeing the mean is no certain evidence of health. Physicians and statisticians have compiled figures, devised diagrams and invented indices with little lasting satisfaction. From the earliest years school health services throughout the country have recorded the measurements of their children and have not known what to do with them. Soon after World War I, the late Prof. Georges Dreyer of Oxford\* made a promising start with weight, sitting height, chest measurement and vital capacity, but he soon had his middle stump knocked out by the statisticians. The L.C.C. has been one of the most assiduous of the local authorities and Pirriet (1950) gave an interesting commentary on three surveys of London children, 1905-1912, 1938 and 1949, Successive Chief Medical Officers of the Ministry of Education have dealt with the subject and "The Health of the School Child 1950-1951" devoted a whole chapter to it even venturing a nibble at Sheldon's somatotyping.

Now Northern Ireland has entered the lists. ‡ Prof. F. M.B. Allen, Professor of child health in The Queen's University of Belfast, finding that little information was available about the physical measurements of Northern Ireland children set about getting information about the weight, height and intercristal measurements of the children of Belfast. The investigation was carefully planned by a committee of the most knowledgeable persons in Belfast and the greatest care was taken to avoid statistical stumbling blocks. A sample of 12,700 out of the 65,000 children of Belfast aged five to 13 years inclusive was taken (although about 10% escaped measurement owing to absenteeism or refusal), no children were rejected because they were obese or tall or short, and it happened that those measured included an achondroplasiac, a one-legged and two one-armed children among 10 frankly abnormal children. The actual measurements were done in such a way as to minimise errors-for instance all were carried out by the same team of workers at one centre and were spread out throughout the year to smooth out the possible effects of seasonal variations in growth. The weighings were done on a large platform balance with a two-foot shadowless dial, the accuracy of the machine being varified at the beginning, middle and end of the survey. The results are most clearly set out in tabular and graphic forms showing the mean, the first decile, the median and the ninth decile with other necessary statistical information. Both metric and Imperial measurements are given.

The authors, Dr. E. A. Cheesman and Mr. A. L. Walby, of the Department of Social and Preventive Medicine of the Queen's University and of the School Health Service of the Belfast Health Authority, claim with justification that the data forms the most up-to-date and reliable series of heights, weights and intercristal diameters of Belfast children, and the similarity of results with height and weight estimates from other sources suggest that they might safely have wider application outside Belfast. It is observed, however, that the average is probably undergoing small changes under the influence of social and other factors.

<sup>\*</sup>Dreyer, Georges, (1920), Assessment of Physical Fitness, Cassell.

<sup>†</sup>Pirrie, G. D., November, (1950), Monthly Bull. Min. of Hlth. & P.H.L.S., 9.
†The Physique of Belfast School Children. Cheesman, E. A.

<sup>†</sup>The Physique of Belfast School Children. Cheesman, E. A. and Walby, A. L. Supplement No. 3 to *Ulster Medical Journal*, 1964.

# PERSONAL FINDINGS OF SCHOOL MEDICAL INSPECTION \*

By W. J. PIERCE, M.B., CH.B., D.P.H. Senior School Medical Officer, Northumberland.

Many of us have taken part in the production of the Annual Reports of the School Medical Officer and know how the Staff and Ancillaries are enumerated in the first few pages, whilst at the end of the report are tables relating to the School Health Service. So often between there is a bald statement of the findings of medical inspection backed up by bare statistics, but behind these lie experiences grave and gay, indeed often there are episodes of human drama. It is a story of many personalities all with qualities of their own; some with eccentricities.

Medical inspection, according to Wilkins,† is a periodical health audit of the whole child; the words "whole child" being taken to include the child himself, his environment and his response to that environment. The basis of success in the School Health Service is the understanding watch kept over the child in health as well as in sickness. To achieve this object there is on the stage the School Medical Officer, the Health Visitor, the Teacher, the Parent and, of course, the Child; but full achievement can only be obtained by whole-hearted co-operation between all these

#### The School Medical Officer

Let us see what qualities are needful in the School Medical Officer. (We are taking him first for convenience, not because we think that he is the most important).

Primarily, he must be fond of children and have a real interest in their welfare. He needs patience and tact, kindliness and a knowledge of human nature; these, together with a sense of humour, will carry him far. If he merely seeks financial gain, let him look elsewhere, as few branches of medicine are so poorly paid. For example, I am concerned in the vexatious anomaly of having an officer for whose work I am responsible to the Committee receiving £200 per annum more than me; and again I recall that an S.M.O. junior to me who joined the Hospital Service on the "appointed day" now receives a salary twice my own.

It is true that one cannot get bread without dough, and I think that we deserve more dough! To compensate, however, there is the absorbing interest of seeing children develop from infants into hefty youths and comely maidens of the school leaving age. That period of 10 years and more sees the unfolding of the child's physical and mental potentialities as a bud opens into the flower.

The impressions one might make with children may seem casual to the School Medical Officer but to the child—and also his parent—may be of importance. Recently I was seeing some school leaver boys and one came up all smiles—so much so that I sought the cause of his pleasure—he told me that it was because he was coming to see me. Suspecting a leg pull I asked why, and was surprised by the answer that he remembered how frightened he had been at his first medical inspection as a five-year-old, but he had only been in the room a little while when he knew it would be all right. Naturally, I remembered nothing of an isolated case at medical inspection 10 years earlier—but a favourable impression had been made on a young mind when apprehension had been replaced by confidence.

I came up against authority within weeks of joining the Service. I found that "enlarged tonsils" was listed by the Ministry—or Board as it was then—as a defect, and finding this had to be recorded as such. I could not agree that the enlarged tonsil, per se, was necessarily a defect and registered my protest. My chief took it up and after much corres-

pondence the term was eventually altered to "chronic tonsillitis." A minor victory for the raw recruit!

The undertaking of the medical examination of candidates entering Teachers' Training Colleges (Form 4 R.T.C.) by the School Medical Officer has brought many old friends back to the distal end of my stethoscope. Even now I receive letters from young men, whom I have examined as boys, seeking advice upon medical and socio-medical questions. Not always is our work so smooth or so encouraging—situations may even be embarrassing. When I was fairly new to school medical inspection I had examined a boy of about nine and found him quite fit and told his mother so; but she said she would like him to have a "proper examination." To please her I listened to heart and lungs again but still found no lesion. However, when she insisted that she wanted her boy to have a "proper examination," I asked her what she really meant and received the reply "I'd like you to tell me if he ought to be circumscribed." The health visitor and myself exchanged glances but no word indicated our thoughts.

#### The Health Visitor-School Nurse

This brings me to the first vital link between School Medical Officer and child, namely, the Health Visitor (or School Nurse). School medical inspection would be almost impossible without her; she it is who, in the school, does the spade work of preparation for medical inspection. Even of more value is her contact with home life, and so she is invaluable in retailing to the S.M.O. the parental and environmental influences which bear upon the child. We all appreciate the value of knowing the sociological background of the child who is to be seen at medical inspection, and the wise health visitor can fit the jig-saw together and present us with a complete picture. By their knowledge and experience, and infinite tact, they make the examination of the child and the interview with the parent much easier for the School Medical Officer. The good reputation of the School Health Service, including the impression the parents have of our worth, is in safe keeping whilst we retain the services of the health visitor who makes her iob a "vocation."

#### The Teacher

I know of no profession (other than our own) in which its members are prepared to do so many extraneous duties as the Teaching profession. These are they who cooperate with the School Health Service on the actual stage, even if they do not come to the footlights. Their interest is shown by the number of children they ask us to see as "specials"; and by their willingness to help they contribute materially to the success of the school medical inspection. Their intimate knowledge of their scholars is often revealing—for example, it will be remembered that in mass audiometry tests carried out during past years the number of children found to be deaf or partially deaf who were not already known by the teachers to be thus handicapped was exceedingly small. We would like them to know that we much appreciate their help and co-operation.

Of course, as with other professions, they have their "funny uns," like the teacher who, during an investigation into malnutrition, was asked to weigh boys without shoes or waistcoats wrote that he had no boys in his school without shoes or waistcoats.

#### The Parent

To the parents who play such an important role between the doctor and the child we should be grateful—for without them there would be no children. Their influence is exerted upon the child with varying degrees of success. We can be fairly sure that they will see that their child has a bath before medical inspection and, in most cases, they have obviously prepared the child mentally for the ordeal. Indeed the confident way most children now enter the medical room supports that view. The crying child can be an embarrassment to every adult associated with the examination, and weeping can be disastrously infectious. Fortunately,

<sup>\*</sup> Presidential Address to the School Health Service Group, Society of M.O.H.

<sup>†</sup> Wilkins, E. H., The Medical Inspection of School Children. Baillière, Tin Iall & Cox (1952).

the youngsters have been so well handled in the Child Welfare Centres in pre-school life that the ordeal of crying

children is experienced very seldom.

Of the many agencies of health education we are told that conversation is probably the best medium, and where can this better be exercised than between doctor and parent at school medical inspection? I believe that the best service we may render ourselves is to listen to the parent who attends. It is usually the mother (although a great-grandfather once came to one of my medical inspections), and she will so often give the right clue to the problem of her child's health. The way she helps the child to undress, fusses over him, or leaves him to struggle alone is often a clue to what happens at home. Then, when we have examined the child, let us be frank about our findings and kindly in our advice. Not a large proportion of the disa ilities we detect need "surgery" or "medicine," but most need guidance for mother and child. This is time-consuming, but pays high dividends in good will. Let not School Medical Officers examine in an atmosphere devoid of warm-heartedness. Mutual trust will open the floodgates of confidences and so put the doctor in an advantageous position to give advice which will be heeded. That parents on the whole have a good opinion of the School Health Service is shown by the percentage of attendances at school medical inspections. In towns one expects them to attend in goodly numbers, but when in a rural area with great distances to travel, such as the one in which I serve, over 75% attend, they must think it worthwhile to meet the doctor who examines their child.

We know that the school leaver is not so often accompanied by his mother, and this may not be due to disinterestedness on the part of the parent, but an indication of an awakening independence on the part of the child. Once at a medical inspection of leaver boys, I heard quite a disturbance outside the examination room and when the next boy came in his face was turkey red-and so was his mother's. It was obvious what had happened, and after the examination I felt impelled to explain to the boy his mother's interest and how glad I was to see her; and to the

mother the boy's natural reticence.

"So for the mother's sake the child was dear, "And dearer was the mother for the child." (Coleridge) Anyway, they both went away "good friends" with each

other and, I hope, with me.

Parents, you will agree, are not always the best judges of their children-seldom can they see any but the grossest defects in their own offspring (every mother's duckling is a potential swan). Some time ago, examining a six-year-old I found he lisped markedly, but when I asked his mother if she had noticed it, her own lisping reply "Do you llink llo, doctor? showed that she had little idea of her son's speech

Sometimes one has to rescue a child-usually a boyfrom an over-anxious or over-indulgent mother. I was asked to see a little boy because he suffered from many minor complaints, but an interview with the mother and an examination of the child convinced me that he suffered from "motheritis." I boldly suggested to the mother that she wanted a live doll because that was how she was treating her son, and prescribed that he be put into an old suit and sent to play with other children. To her credit, she accepted the advice and returned some months later to tell me that since mixing with other children he had "never looked

You may have the impression that I think all parents are paragons-far from it. Soon after medical inspection became obligatory a curt note was written across one of the invitations to medical inspection, "I do not wish my child to be examined by the School Doctor." However, the situation was explained to the father, who telephoned to my home late at night, and the mother brought her daughter for medical examination. She was obviously disgruntled that a certificate by their own doctor could not be substituted for a school medical inspection. After the little girl had been examined her mother's attitude was so changed that she

admitted "I have objected to what I didn't understand." And so it is; most objections to medical inspections are made through ignorance.

#### The Child

Now may I speak of the most important entity of all. As we sit at desks carrying out the administration of the School Health Service, it is easy to overlook his existence, so let us for a short time be conscious of him as a very real

It is true that the wealth of a Nation lies in the children. and how it treats them-particularly the handicapped onesis a measure of that Nation's humanity. You and I must believe that or we would not be spending our professional lives on behalf of the young. Our country has done much for the child in this century and not the least of its agencies has been the School Health Service. Thank goodness we are very far removed from the evil days of child (slave) labour. Maybe, as in many movements the pendulum has swung a little far the other way-if so it is a good fault.

All children are not angels, as most of us know from They are extremely imitative (we take advantage of this faculty in our educational system) and naturally they find it easier to imitate the bad ways than the good ones, but a pleasing feature about children is their enthusiasm and responsiveness, which makes working for them so gratifying. Sometimes their enthusiasm runs away with them, as with a Grammar School boy who, after a medical examination, when clothed in little more than a smile, whispered "Can I ask you a personal question?"—and when I told him to "fire away" he ran off and I guessed that he had thought better of it; but imagine my surprise when he returned, and producing an album from behind his back, asked "Please sir, will you sign my autograph book?"

The child population is like a race that has started—some bright ones well out in front, a good average bunch in the middle, with weak or handicapped ones bringing up the rear. The bright ones may not need us very much, and even the child psychiatrist may affect them little. Of the mass in the middle, no two are alike and it is interesting how little things reveal their outlook or insight.

A young boy was having a hearing test when the following dialogue took place "What are the first three letters of the alphabet?"
"A, B, C."
"And the lest three?" "X V Z"

"And the last three?" "X, Y, Z."
"And what comes after T?" "Supper!" I'm not sure if this was outlook or insight.

#### The Service

In the years that have passed since the Service was established the amount of good which has been achieved on behalf of this average group must be enormous; but, undoubtedly, the crown of our achievements concerns those who lag behind on account of physical or mental

handicap.

What a wealth of pathos may often be hidden behind that cold word "ascertainment"; indeed perhaps our saddest duty may be to tell parents of our "findings," particularly if their children are educationally sub-normal, or worst of all, ineducable. I do not need to recall to you the categories of these handicapped pupils, but to illustrate my contention of the good we may do by personal service one could recount many cases in which children with handicaps have been encouraged to live as normal a life as their disability permits.

The accounts that I have given will probably tally with many of your own experiences. If so, I am happy that we have travelled a similar road in our professional journeyings.

#### The Future

What then of the future?

First I make an earnest plea for more adequate recognition of the School Medical Officer as a paediatrician and one skilled in preventive medicine, and that his financial reward should be commensurate with the importance of his responsibility. This being granted, a great difficulty of

recruitment may be overcome.

Much of what-I have said has been very personaloccasionally maybe facetious, but do not think me priggish if, in conclusion, I appeal to all who are already in the School Health Service and those who may enter later, to Suffer little children . . . for of such is the Kingdom of Heaven.

#### THE PREVENTION OF POLIOMYELITIS \*

By Dennis H. Geffen, O.B.E., M.D., D.P.H.

Medical Officer of Health St. Pancras and Hampstead

Metropolitan Boroughs

I hope that the title of this lecture has not led you to believe that I shall be able this afternoon to describe methods of preventing poliomyelitis. At the time of writing such a happy stage has not yet been reached. I can only inform you of preventive measures that are being tried and give you information of various research projects that are being pursued with vigour and a sense of urgency.

#### Virology

Poliomyelitis is caused by a virus of which there are three types, Brunhilde (I), Lansing (II), and Leon (III), and various strains have been recognised in each of these types. It is important to realise this basic fact when dealing with either active or passive immunisation, for an attack or outbreak of poliomyelitis may be due to any of the three types of virus. To be effective active or passive immunity must provide protection against all three types.

#### Pathogenesis

For many years it was considered that the infection of poliomyelitis was a droplet infection and that it entered the human body through the nose and reached the brain via the olfactory lobes from which it spread to parts of the brain or the cord. Recent research, however, has shown that virus cannot be recovered from the olfactory lobes in experimental animals unless, as in the case of rhesus monkeys, they have been infected by intranasal installation of the virus. It is not recovered from the olfactory lobes from fatal cases in man, and post-mortem studies rarely show involvement of

olfactory centres.

Virus is recovered, however, in the faeces of a considerable proportion of cases in man and experimental animals and is present in large quantities. To-day we tend to consider poliomyelitis as an alimentary infection forming its first habitat in the gut where it grows and from which it is excreted. Its further spread in the gut is a matter of some controversy. At one time it was thought that the virus travelled up or along nerve routes and in fact in experimental animals it does do so. This theory assumed that at no time did the virus invade the blood stream, a viewpoint supported by the fact that virus had not been recovered from the blood of patients suffering from clinical poliomyelitis nor from experimental animals.

A few years ago Bodian postulated the theory that inability to recover the virus from blood was due to the fact that it had not been looked for at the right time. He recovered the virus from experimental animals in the pre-paralytic stage and it has been found in the blood stream of cynomolgus monkeys and chimpanzees four to six days after being fed the virus ('and'). Furthermore 10 children suffering from minor illnesses later diagnosed as abortive cases of poliomyelitis, and one infant with no symptoms, were found to have type 1 virus circulating in their blood streams 3. It is now more or less accepted that viraemia occurs in the

pre-paralytic stage of poliomyelitis.

This brings us to the theory which is now supported by sound practical research that the virus is ingested, that it proliferates in the intestines, that it spreads from there to the blood, where it causes a viraemia and that in certain cases it enters the central nervous system at points where penetration is less difficult. One of these points is the area postrema in the medulla oblongata.

When dealing with host factors I will enlarge on these points and indicate some influences which may render the central nervous system or parts of it more penetrable by the

#### Possible Methods of Prevention

There are three methods in the prevention of poliomyelitis which I would like to consider. They are:—

(1) The production of passive immunity.

The achievement of active immunity. Host factors.

(3) Passive Immunity

Individuals who have had poliomyelitis develop antibody in their blood. This antibody is specific to the type of virus to which they have been exposed or by which they have been infected. It is possible, however, that when the host develops antibody to one type of virus the immunity to other types is also raised. These antibodies are said to be long lasting. Specific agglutinins are also formed but their presence in the blood is of shorter duration. Gear of South Africa has stated rather picturesquely that "an individual's past experience of infections is clearly inprinted in his blood and by appropriate tests it can be revealed." Melnick of the University of Yale delivered papers in Rome and Buffalo in which he stated that by examination of the blood of a representative proportion of a community it was possible to assess the extent to which that community had been exposed to or suffered from poliomyelitis and the particular types of virus involved. If agglutinins (short lived) and antibodies (long lived) were present infection or exposure was recent. If only antibodies (long lived) were present then infection or exposure was some years back. Not only could he indicate the history qua specific infection of the community but he could predict the future if further exposure took place 5

These points are important because if poliomyelitis is associated with a viraemia and the production of protective antibodies then it should be possible by giving blood containing antibodies, or some extract thereof such as gammaglobulin, to provide immunity to infection if sufficient be given at the right time and under the right circumstances. Experimentally Bodian passively immunised groups of cynomolgus monkeys with human gammaglobulin and immediately fed them with poliomyelitis virus. Equal numbers served as controls. In 104 monkeys receiving gammaglobulin no paralysis occurred. In 97 control animals 27 became paralysed.6

Attempts have been made to prevent poliomyelitis in human communities by giving gammaglobulin. In, 1952 54,772 children were inoculated, of whom half received gammaglobulin and the other half were given gelatin. The clinical investigators were not aware which substance had been inoculated into individual children until after the

study had been completed.

A total of 104 cases of paralytic poliomyelitis occurred during the follow up period of 14 weeks. From the second to the fifth week the investigators stated that there was significant though not a complete degree of protection. Paralysis appeared in seven children who had received gammaglobulin as compared with 39 who had been inoculated with gelatin. After the eighth week no protection was found to exist. They admitted that the injection of gelatin was associated with an increase of paralysis in the limb of injection.

In 1953, 235,000 children were inoculated. The members of the National Advisory Committee appointed for the evaluation of gammaglobulin were of the opinion that their analysis of the data did not yield statistically measurable results. From analysis of information on the efficacy of gammaglobulin given to family contacts, the committee decided that admiinstered by this method, with the pro-

<sup>\*</sup> Address to the Metropolitan Branch, Society of M.O.H.

portions involved and in the dosages used, it had no apparent effect on the incidence or severity of paralysis developing

in subsequent cases.7

I had the advantage of hearing various speakers on the subject of gamma globulin in Rome and quite candidly I was unable to persude myself that at the present moment there is much to be said for the use of gamma globulin to protect communities from paralytic poliomyelitis. It has been suggested in England that it might be useful given to contacts, nurses, medical students, babies exposed to infection soon after birth, and children in hospital wards in which a case of poliomyelitis develops. Even if it does produce increased antibody titre the effect lasts for a maximum period of eight weeks and probably not more than five.

There was some controversy originally as to whether gamma globulin prepared in England would contain antibodies to all three types of poliomyelitis virus in that fewer individuals have been exposed to infection in England than in the United States of America. An assurance was given, however, that the gamma globulin had been tested and

contained antibodies to all three types of virus.

I do not think the prevention of paralytic poliomyelitis rests in passive immunity. It is expensive, uncertain, unreliable, and at the best the immunity it gives is shortlived.

There may be, however, exceptional and particular circumstances. Gamma globulin was given to Queen Elizabeth and the Duke of Edinburgh when they visited Australia, their exposure to possible infection being controlled and of limited duration.

#### Active Immunity

Active immunity has been attempted by the production of :-

(1) A live vaccine (2) A dead vaccine.

You will be aware that a live vaccine against yellow fever has been produced and at one time most research workers were attempting to repeat this satisfactory result in relation to poliomyelitis. In a paper which Jonas Salk read in Rome he stated that his group worked on an attenuated type of living virus vaccine until it was shown that in human beings a non-infectious or dead virus preparation could stimulate a serological response similar to, and even greater than that which follows natural infection. As a result further work on the live virus vaccine was postponed and his group concentrated on a vaccine killed with formalin. Such a vaccine must fulfil the following criteria.

(1) The virus must be completely killed;

(2) The vaccine must have no deleterious effects and

It must produce immunity to the three known

types of poliomyelitis virus.

It is not easy to be sure that in all batches of vaccine produced on a commercial scale the virus will be dead, and in fact in trials of a vaccine some years ago in America some 12 children did develop poliomyelitis after injection, paralysis affecting chiefly the limb of injection or the contralateral limb. I think it was agreed that the virus in this trial had not been killed. The difficulty lies in exposing the living virus to a sufficient concentration of disinfectant, in this case of formalin, to kill it, yet nevertheless to preserve its antigenic properties. The virus is grown on monkey kidney tissue and again one has to be sure that there will be no nephrotoxic reaction. The vaccine must contain strains of each of the three known poliomyelitis types of virus and each of these types must produce antigenic response.

The vaccine, having been prepared, was given small scale trials. It was found that the antibody titre in the blood to all three types of virus was increased, after three injections at suitable intervals, to a height which exceeded that obtained

in natural infection.

May I say immediately that the path of Salk and his team has been by no means easy. There were those who said that the vaccine was dangerous in that there was no definite proof that the virus had been killed or would be so in sub-

sequent batches. There were others who argued that there might be nephrotoxic reactions, and a further school that have said that there is no certain knowledge that the immunity produced will either be lasting or adequate to prevent an attack of clinical paralytic poliomyelitis.

Let me see how much of this I can answer.

I have listened to all three schools who have raised objections to the formalised vaccine and whilst I can appreciate their arguments I think the answer must be this. The Salk or formalised vaccine has now been given to over 600,000 individuals and to date no untoward effect has been noted. I admit that this is no guarantee of the future, but I am satisfied that insofar as it is possible to say of any vaccine that it is safe, that statement as to safety can be made of this vaccine.

I do not think anyone denies that it produces antibody response of a high level. I want. however, to be clear on this point. The Salk team have not stated that the formalised vaccine will prevent clinical poliomyelitis.

On the occasions when I have heard him speak, Salk himself has made no such claim. He has stated that his vaccine is safe, that adequate precautions were taken to secure that it should be so and remain so and that it produces a high antibody response. The question as to whether it will prevent poliomyelitis is now being assessed by Dr. Thomas Francis, Jr., Prof. of Epidemiology at Ann Arbor, Michigan, and a team of expert observers, and I hope that between March and June of 1955 we shall be informed of the results of the experiments that took place in 1954.

There has been some criticism that there have been no published results on chimpanzees or monkeys which have been vaccinated with the formalised vaccine and then challenged with a virulent strain of poliomyelitis. This is true, but in an interview with Salk he did show me the results of experiments in which he challenged inoculated monkeys with intravenous injections of living virus. Eight out of 10 of those vaccinated survived. The two who died developed little antibody. Of the controls six out of 10 died.10 I think it is unfortunate that these results, which are only a small portion of Salk's work on this vaccine, have not been published. It is understandable that no observer can publish everything. Like many others Salk has a large collection of data awaiting the time when he will have sufficient leisure to edit and publish. I think all research workers will understand and appreciate this particular difficulty.

Let me give you some examples of the test that has been carried out in America during 1954. The figures I am presenting are round numbers and only approximately

210,000 children were given the Salk vaccine and are being compared with a similar number who have been given an injection of solution identical with the vaccine except for the presence of virus and monkey kidney tissue (solution 199 used for

the cultivation of virus).

Another 400,000 children in grade 2 in schools throughout America have been given the vaccine and are being compared with 400,000 in grade 1 and 400,000 in grade 3. You will see that some 650,000 children have been inoculated and are being compared with 1,200,000 controls, some of whom have been given a placebo vaccine. The trial, therefore, embraces 1,800,000 children. The figures include children who did not complete children. The figures include children who did not complete the trial. Every one of these children has now got to be followed up. I am told that no less than 150,000 persons will have assisted in the total vaccine programme. These include clinicians, epidemiologists, health officers, physical therapists, virologists, school teachers and administrators. 14,000 schools co-operated and a staff of 100 operators are engaged on a 24 hour basis—clerks, coding experts and statisticians. Grants in excess of 850,000 dollars (approximately £300,000) have been made to the University of Michigan. This is part of the total of 7,500,000 dollars (over 2½ million pounds) granted by the National Foundation for Infantile Paralysis of America for the vaccine programme.

The results will be placed before a Committee under the chairmanship of Dr. Francis and I have no hesitation in stating that whatever information is received through Dr. Francis' committee will be based on the soundest and

most unbiased principles.

This problem of following up 1,800,000 children is an enormous one. It will be necessary to find out whether or not any of these children developed poliomyelitis during 1954; whether the attack was paralytic or non-paralytic and what muscles were involved. In addition cases diagnosed as suffering from clinical poliomyelitis in the appropriate groups of protected or control children will have the diagnosis confirmed by blood and stool examination. Antibody titres of children before and after inoculation have also been carried out.

I think that whilst we must possess ourselves in patience I may quote one or two remarks. Salk stated in a lecture in Rome 11:—

"That there is still much to be learnt is clear indeed. Nevertheless it does appear that by suitable manipulation of the dose of vaccine and of the intervals between inoculations, it should be possible with relatively few injections, properly spaced, to provide long term immunity. The ultimate object is not merely a reduction in the amount of crippling and death from poliomyelitis but also the elimination of these as a cause of fear. It will be clear, therefore, that the problem will not have been fully solved until a means is available that will with certainty and for life make this possible."

Dr. Thomas Rivers 18 in a very excellent paper made the following statement:—

"A group of experts under the guidance of Dr. Francis has been established to evaluate the protective effects of the formalised vaccine. The final report will not be available for some months. However, there are reasons to believe that the vaccine will be effective. If it proves to be ineffective most workers will contend that a good one can be obtained soon."

This I think summarises the situation as we know it at present. I am hopeful of the outcome of the present trials, although I do not think they will be 100% effective. I know, however, that the vaccine is being improved at the present moment and that it cannot be long before the end of the road is in sight.

#### Trials with a Living Vaccine

Work is energetically proceeding with live vaccines. One team of research workers under Milzer 13 is experimenting on a trivalent vaccine inactivated by ultra-violet light.

Most interesting work, however, on live vaccines is being carried out by Sabin at Cincinnati. He has found that by passing virulent strains of virus through monkey kidney tissue in rapid succession, a vaccine can be prepared which has antigenic property but which will not cause paralysis when injected directly into the brain of cynomolgus monkeys. The vaccine he was using had been made up by rapid kidney tissue inoculations, 33 times with type 1 virus, 51 times with type 2, and 34 times with type 3. A more painstaking and persistent worker than Sabin I have never met. I think his aim is to produce a vaccine which will be effective when given by mouth, and I have the greatest faith that Sabin and his team will ultimately achieve the success which they undoubtedly merit.

#### Host Factors

Under this heading I would like to consider why it is that when 100 people become infected with the virus of poliomyelitis perhaps 90% remain symptomless, 9% show signs of disease varying from a sore throat and intestinal upset to stiffness of the neck, whilst 1% show definite paralysis.

Why is it that 99% escape paralysis or alternatively why is it that 1% become paralysed

We are apt to forget that poliomyelitis is possibly the least serious of all infectious diseases with the exception of that one complication or extension of the disease which destroys motor cells in the brain or cord and causes paralysis. Apart from this it appears to be a mild infection lasting a few days, the symptoms of which are possibly less serious than a cold in the head, and from which recovery is complete

and immunity lasting. If we could be sure that an individual contracting poliomyelitis would not become paralysed then there might be much to be said for spreading the disease in order that a community should obtain natural immunity. It is only its capability of causing paralysis that makes the virus of poliomyelitis a serious pathogenic organism.

There are certain host factors which are generally accepted:—

- Paralytic poliomyelitis is known to follow operations for the removal of tonsils and adenoids and then to be of the bulbar variety.
- (2) Pregnant women are susceptible to poliomyelitis and may contract it in severe form.
- (3) It is associated with undue exertion, fatigue and chill.
- (4) It may follow body insults such as injection, fracture and operative procedures, when paralysis will show localisation referred to the area of insult. (15,16).

I want to carry these observations a little bit further. Gaylord Anderson, Prof. of Public Health in Minnesota, has written two papers in which he shows that:—

- (a) Persons with the bulbar type of poliomyelitis give a history of removal of tonsils and adenoids more frequently than do persons with other forms of poliomyelitis.
- (b) If a tonsillectomised person develops clinically recognisable poliomyelitis, the likelihood of bulbar involvements is four times as great as in one where the tonsils are in situ.
- (c) This higher proportion of bulbar cases in tonsillectomised persons occurs at all ages and regardless of the time that has elapsed since the operation.
- (d) The higher proportion of bulbar cases in older persons is due primarily to absence of tonsils rather than to age per se.

Here is a statement to the effect that bodily injury has a localising effect on paralysis when an individual is attacked by poliomyelitis irrespective of how long a time it is since that injury was suffered.

A theory is propounded that when the host is subjected to a local injury, such as tonsillectomy, a permanent change takes place in the nerve cells enervating that area, which has rendered them, or their surrounding blood vessels, more permeable to the virus of poliomyelitis, or less able to resist its cell destroying (cytopathogenic) properties. Gaylord Anderson has followed this a step further in connection with persons who contracted paralytic poliomyelitis and have had their appendix removed at some previous date. He expected that the right leg would be involved more often than the left. He failed, however, to find that this was so.<sup>17</sup>

My own experience in persons contracting poliomyelitis in the three weeks following appendicectomy is that the abdominal muscles and diaphragm are usually involved and there may be a paralytic ileus. I have no data on the long term effect of appendicectomy in localising poliomyelitis.

Bodian in Baltimore has carried out some very interesting work in connection with poliomyelitis following injection.1 His experiments have been done on cynomolgus monkeys and he has injected virus directly into the heart (Mahony strains of type 1). Paralysis occurs in 50% of monkeys so treated and in at least 20% the initial paralysis is in the face. If, however, these monkeys have been injected with various irritant substances including gelatin, cortisone, penicillin and diphtheria-pertussis-tetanus vaccine within one to three weeks prior to the giving of the virus, he finds that not only is there an undue proportion of cases where paralysis affects the limb of injection (the hind limb) but that instead of 50% of the monkeys developing poliomyelitis the figure is now raised to 80%. Not only has the risk of developing paralysis in the limb of injection been increased, but the risk of the host developing paralytic poliomyelitis has been increased.

Personally I have always believed that an injection of diphtheria-pertussis vaccine not only localises the paralysis of persons infected with virus but also increases the attack rate, though I must admit I have no figures to prove this for

they are not easily obtainable.

Bodian's experiments with cynomolgus monkeys lends support to this view. I think Bodian considered that when a person suffers an injury such as an injection, the blood vessels or the anterior horn cells supplying the injured part become more penetrable to virus. In this connection I would like to mention one point that ties up with Gaylord Anderson's work on the far-reaching effects of tonsillectomy. In the course of his work in injecting monkeys intracardially with virus, Bodian writes :- " Of considerable interest in this connection is the fact that three instances of the provoking effect of long-standing trauma apparently have occurred in our cynomolgus monkeys which were inoculated intravas-cularly. One animal with an old healed tibial fracture and one with an old healed accidental amputation at the ankle, were initially paralysed in the corresponding leg. A third animal who was received with an old right eye injury, including corneal opacity, was paralysed initially in the right facial muscles, both upper and lower."

I think we shall have to pay very considerable attention to the far-reaching paralytic effects of bodily insult on the host

exposed to the virus of poliomyelitis.

The last research studies to which I would like to draw attention are associated with pyridoxin and cortisone.

#### Pyridoxin

Pyridoxin or Vitamin B6 occurs in yeast, liver, rice and bran and can be prepared synthetically. It is an important factor in nutrition and deficiency may give rise to a symptom complex in which muscular weakness and rigidity are prominent. A deficiency of Vitamin B6 decreases human reaction to infection and lowers antigenic response in the

Bodian reports :- 19

(1) That paralytic poliomyelitis occurred in an uninoculated laboratory rhesus monkey that was being deprived of pyridoxin. Poliomyelitis in uninoculated rhesus monkeys (with one doubtful exception) had previously not been known to occur.

The virus isolated from this monkey was shown to be of the Brunhilde type, that is type 1, and was in use in the laboratory at the time of infection and probably present in the environment

of the animal quarters.

(3) In that this appeared to be the first known natural or laboratory spread of poliomyelitis in rhesus monkeys an attempt was made to see if the deficiency of pyridoxin was the causal

Eleven rhesus monkeys were treated with desoxy-pyridoxine. This has the same effect as depriving them of pyridoxin. The monkeys were then fed orally with Brunhilde virus. succumbed to paralytic poliomyelitis although this species of monkey is known ordinarily to be insusceptible to poliomyelitis

as a result of oral feeding.

Here is a possible example of an association between a vitamin deficiency and enhanced liability to contract poliomyelitis and you may care to consider this in relation to the fact that communities living in civilised and hygienic conditions tend to sophisticate their food and are more prone to poliomyelitis than those living in unhygienic surroundings. I must admit that I have no evidence that sophistication of food results in a deficiency of pyridoxin. In an interview, moreover, that I had recently with Bodian he felt that his findings on monkeys deprived of pyridoxin might easily be due to the fact that the 11 monkeys were receiving numerous injections daily of desoxy-pyridoxin and that these injections in themselves might have rendered the monkeys more prone to develop poliomyelitis. I am not entirely convinced on this point and I hope that further work will be carried out on the effect of pyridoxin and susceptibility to poliomyelitis.

#### Cortisone

Lastly I would refer to some excellent work that has been carried out by Shwartzman in the Mount Sinai Hospital in New York. 30

Previous experiments had suggested a relationship between endocrine imbalance and predisposition to poliomyelitis. Curley and Aycock in 1946 at had reported that castration in monkeys induced a greater susceptibility to the intranasal inoculation of the virus whilst treatment of the castrates with oestrogen increased their resistance.

In 1939 Horace Hodes had demonstrated :- \*2

(1) That virgin and pregnant Swiss mice were equally susceptable to intracerebral inoculation of St. Louis encephalitis

That following subcutaneous vaccination with the St. Louis virus the great majority of virgin Swiss mice became

immune.

(3) That the majority of pregnant mice though vaccinated did not become so immune.

(4) That pregnancy not only interferes with the development immunity.

It is generally accepted that pregnant women have decreased resistance to infection with poliomyelitis and Venning in 1946 showed that there is a greatly enhanced adreno-cortical function during pregnancy with hyperproduction of cortisone.

Shwartzman set out to see if there was a relationship between cortisone and liability to contract poliomyelitis, or, to put it round the other way, if cortisone lowered resistance to infection with poliomyelitis virus. He chose an animal which is generally refractory to poliomyelitis, namely, the Syrian golden hamster. If these be inoculated intracerebrally with the Lansing type of poliomyelitis virus, about 25% die. If they be injected with cortisone the mortality rate can be raised to nearly 80%. Intraperitoneal injection of massive doses of Lansing strain of poliomyelitis fails to cause disease in normal golden Syrian hamsters. If they be given injections of cortisone and then an intraperitoneal inoculation of virus a severe disease is elicited.

Shwartzman's work is extremely important when we consider host factors in relation to resistance to poliomyelitis infection. We already know of the effects of pregnancy, chill, operation, fatigue and local injury or insult such as injection. These are conditions of stress in which there may be hyperproduction of cortisone.

This must be taken into account when we consider the

prevention of poliomyelitis.

So far gamma globulin has not proved a practical means of preventing poliomyelitis in a community. May this not be due to the fact that it was given in insufficient quantity or that "sufficiency" of antibody is variable, depending on the condition of the host at the particular time the gamma globulin is given? Is it not possible that a vaccine may produce antibodies which though adequate to secure protection at one time may be inadequate at another? If gamma globulin and vaccines, either killed or active, fail to control poliomyelitis we may yet have to turn to the host factor and find out why it is that there are times when individuals, whilst normally resistant to the invasion of the virus, fail in the battle against this disease. Is this possibly due to "stress," endocrine imbalance, or dietary deficiency?

I am much indebted to our American colleagues for their kindness and courtesy and grateful for all the help I have received. I stood amazed at the concentration and energy with which they are conducting research on the other side of the Atlantic and I cannot be other than optimistic that the time is not too far distant when poliomyelitis will be a

preventable disease.

#### REFERENCES

Sabin, D. (1952.) Amer. J.-Hyg., 55, 414.
 Horstmann, D. M. (1952.) Proc. Soc. Exper. Biol. & Med.,

79, 417.
—, & McCullum, R. W. (1953.) Proc. Soc. Exper.
Biol. & Med., 82. GEAR, J. H. S. International Poliomyelitis Conference, Rome,

MelNick, J. L. Annual Congress American Public Health Association, 1954.

<sup>6</sup> Bodian, D. (1952.) Amer. J. Hyg., 56, No. 1, 78-9.

- <sup>7</sup> J.A.M.A. (1954.) 154, 1086. <sup>8</sup> Ministry of Health, Poliomyelitis, Medical Memorandum, July, 1954.
- SALK, Jonas. International Poliomyelitis Conference, Rome, 1954.

-, Personal communication 1954.

International Poliomyelitis Conference, Rome, 1954. THOMAS. International Poliomyelitis Conference, 12 Rivers, Thomas. Rome, 1954.

 BODIAN, D. (1954.) Amer. J. Hyg. Awaiting Publication.
 ——. (1948.) Amer. J. Hyg., 48, 87-93.
 SWHARTZMAN, GREGORY. Columbia University Press, 1953. 21 Curley, F. J. & Aycock, W. L. (1946). Endocrinology, 39,

<sup>22</sup> Hodes, H. L. (1939). J. Exper. Med., **69**, 533-543. <sup>23</sup> Venning, E. H. (1946.) Endocrinology, **39**, 203.

#### LOCAL POPULATION ESTIMATES FOR 1954

The Registrar-General has issued his estimates of the populations of counties, boroughs and urban and rural districts in England and Wales as at June 30th, 1954. Grouped figures are given for the standard regions, conurbations and density aggregrates and by sex and age for the country as a whole.

This publication is designed to meet a general demand for an

early issue of up-to-date figures of local populations, and in particular to assist local councils and other administrative authorities, manufacturers, and distributors. The figures are the final estimates which will later be embodied in the Registrar-General's Statistical Review for the year 1954. [It has already been announced that the home population of England and Wales at June 30th, 1954, is estimated to have been 44,274,000 of whom 21,288,000 were males and 22,986,000 females and that the total shows an increase of 184,000 over the figure for mid-1953.

Comparison with the estimates for previous years indicate certain trends in the internal movement of the population. The population of the Administrative County of London continued to decline, dropping from 3,343,000 in 1953 to 3,322,000 in 1954. to decline, dropping from 3,343,000 in 1953 to 3,322,000 in 1954. This decline is reflected to a certain extent in the increase in the populations of those areas which contain L.C.C. Housing Estates: Borough of Romford by 1,752, Rural District of Elstree by 1,820 and Borough of Reigate by 2,720. The slight decline in the population of the Administrative County of Middlesex, which began in 1953, continued in 1954, the figure being 2,256,000 compared with a peak of 2,270,000 in 1952. Within the Administrative County of Essex (the population of which increased from 1,644,100 in 1953 to 1,672,500 in 1954) the Urban District of Billericay containing the New Town of Basildon increased of Billericay, containing the New Town of Basildon, increased by 2,590, and the Rural District of Epping, containing Harlow New Town, by 6,330. Similarly within the Administrative County of Hertfordshire (population 651,500 in 1953 and 671,700 in 1954), the Borough of Hemel Hempstead and the Urban Districts of Stevenage and Welwyn Garden City, each of which contains a New Town, increased by 3,460, 2,790 and 1,420 respectively, while, in the Administrative County of Sussex West, the Rural District of Horsham, containing the New Town of Crawley, increased by 4,740.

\*The Registrar-General's Estimates of the Population of England and Wales—Populations of each Administrative Area at June 30th, 1954, H.M. Stationery Office, price 9d. net (or by post from P.O. Box 569, London, S.E.I., price 10½d.)

Sir Alexander Macgregor, formerly M.O.H., Glasgow, and a Past-President of the Society, on March 31st gives up the chair-manship of the Scottish Western Regional Hospital Board, which he has held since its establishment in 1948. The Secretary of State has expressed gratitude for Sir Alexander's "sure touch and general acceptance" during his period of office.

A Correction.—In the report of the M. & C.W. Groups (Public Health, February, 1955, page 82) the word 'dead,' seven lines from foot of left hand column, should have read 'deaf.'

#### Society of Medical Officers of Health

#### ORDINARY MEETING, NOVEMBER

An Ordinary Meeting of the Society was held in the Council Chamber of the British Medical Association, Tavistock House, Tavistock Square, W.C.1, on Friday, November 26th, 1954.

1. Minutes of Last Meeting .- The minutes of the Ordinary Meeting, held on September 16th, 1954, were confirmed and signed by the President.

2. Life Membership.—The following were elected fully-paid Life Members of the Society on the nomination of the Council and of their Branches

Dr. J. F. Macdonald, Lt.-Col. E. F. W. Mackenzie and Dr. J. B. Lowe.

3. Elections.—The following candidates, having been proposed and seconded, were duly taken into membership

Fellows .- Drs. Islay Cecil Barnem, Alexander David Christian Stewart Cameron, David Miller Cathie, Catherine H. Coutts Milne, Raymond Joseph Donaldson, Thomas Christie Falconer, Kate Gray, Edmund Monk Hamilton, Herbert James, J. A. Linden, Thomas Aloysius McVey, Charles Nicholson Minto, Stuart Love Morrison, Basil John Lloyd Moss, Anne Boyd Perkins, Lewis Bernard Peters, Irene Tomina Joan Ruxton, Elizabeth Schonberger, Hope B. Scott, William Sharpe, John Anthony Slattery, Henry Ellis Smith, Donald Shrewsbury Todd-White, Robert Webster, B. N. Williams, Arthur Leslie Thrower, Alfred Yarrow and Sydney Maxwell Young.

Associates.—Drs. William Robert Samuel Robertson, and

Ernest Ward.

Temporary Members attending D.P.H. Courses .- Drs. A. Bukhari and A. F. Mowafi.

Nominations for the next election were reported and the meeting terminated.

#### ANNUAL GENERAL MEETING

The Annual General Meeting of the Society for the Session 1953-54 was held in the Committee Room of the Society, Tavistock House, London, W.C.1, on Friday, January 14th, 1955, at 12.45 p.m.

The President, Dr. Jean M. Mackintosh, was in the Chair and there were also present 12 members of the Society.

1. Minutes of Last Annual General Meeting .- The Minutes of the Annual General Meeting, held on December 10th, 1953, were confirmed and signed by the President.

2. Annual Reports and Accounts.-The Annual Report of the Council, the Treasurer, and of the Editor of Public Health, were received and adopted, together with the Balance Sheet as at September 30th, 1954, and the Income and Expenditure Account for the year ended September 30th, 1954.

3. Appointment of Auditors.—Messrs. Greene, Clements & Co., Chartered Accountants, of 20, Bloomsbury Square, London, W.C.1, were re-appointed the Auditors of the Society.

4. Life Membership.—The following members were elected to fully-paid Life Members of the Society, on the nomination of the Council and their Branches

Drs. Muriel H. Radford, H. W. Barnes, H. S. Banks, Mary Kidd, H. L. Cronk, C. M. Richardson, H. G. Trayer, E. H. Walker, C. E. E. Herington and A. F. Adamson.

5. Elections.—The following candidates, having been duly pro-Fellows.—Drs. June Patricia Cooper, Isobel Beatrice Craighead, Margaret Rosemary Farrell, Marie P. S. Grant, Arthur John Isbell Kelynack, Donald Gordon Noble, Douglas Stuart Parken, Thomas Alun Phillips, George Lee Ritchie, Francis Simm, James Taylor and Eric Dudley Birch Wolfe. posed and seconded were elected to Membership of the Society

Temporary Fellows, attending D.P.H. Courses,—Drs. Edwin Inman Blenkinsop, Maureen Henderson, Joyce Heather Hindmarsh, John McCormack and Helen Herbison Reid.

Nominations for the next election were reported and the Meeting terminated at 1 p.m.

#### EAST ANGLIAN BRANCH

President: Dr. Kathleen M. Harding (Dist. M.O.H., E. Suffolk).

Hon. Secretary: Dr. G. R. Holtby (Dist. M.O.H., Norfolk). A meeting of the Branch was held at The Scole Inn, Scole, on sturday, September 18th, 1954, at 3 p.m. The retiring President, (Dr. K. F. Alford) was in the chair and 20 members were present.

#### Public Health in the Sudan

Dr. A. E. Lorenzen, who was formerly Director of the Sudan Service, began by giving a brief description of the geographical position of the Sudan, its size, climate, vegetation, fauna, and of its people and their main foodstuffs. The population is about 8 millions (density 8 to the square mile). He then gave an outline of the system of education, from elementary schools to the University College of Khartoum with which is associated the Kitchener School of Medicine, and of the economy of the Sudan. There are about 150,000 children attending schools in the Sudan.

He spoke of the development of the Sudan Medical Service from the time of the reoccupation in 1899 and of its present organisation together with the medical facilities provided: 40 hospitals with 8,000 beds (about one bed per 1,000 of the population) and 400 dispensaries for out-patient treatment. In 1948 there were 140,511 admissions to hospital (about one admission to every 57 of the population) and nearly 10 million out-patient attendances (about one attendance for every man, woman and child in the population).

Causes of death in those admitted to hospital were in the order of frequency:—(1) diseases of the alimentary canal, (2) pneumonia,

(3) misadventure, (4) malaria.

Sickness rates for government officials were in the year 1947 :-1.95 days per official for all those employed.

British Sudanese 2.85

Egyptians 2.65 All categories of medical staff are trained in the Sudan-

doctors, medical assistants, nurses, midwives, health visitors, dispensers, laboratory assistants, radiographers, sanitary inspectors, etc. The first school for training midwives was opened in 1922 and, in 1947, of the 2,911 births in Omdurman 2,849 were attended by trained, licensed midwives-the maternal mortality rate being 1.9 per 1,000 live births and the infant mortality rate 46.

Epidemic Disease. Louse-borne relapsing fever entered the Sudan from the West in 1926. There was then a high mortality rate among untreated cases-estimated to be about 60%-and the largest number of cases occurred in 1944, when there were some 20,000 with a 10% mortality rate. Thereafter, coincidentally with the free use of D.D.T. powder, the number of cases fell rapidly from year to year—about 250 being notified in 1948.

There have been recurring epidemics of cerebro-spinal meningitis. Over 13,000 cases, with 9,000 deaths, occurred in 1936. The sulphonamides were first used in mass treatment in 1939, the mortality rate being 14% in treated cases. Yellow fever broke out in epidemic form in 1940. In all there were probably about 15,000 cases with 1,600 deaths. Since then, there have only been a few isolated cases. Malaria is endemic, endemic and epidemic. The most common form is Malignant Tertian but Benign Tertian also occurs while Quartan is uncommon. Among patients dying in hospital, malaria is listed as the fourth most common cause of death. The mortality rate in hospital is about 2% and between 10,000 and 20,000 cases are treated as in-patients annually. Among the endemic diseases, ankylostomiasis, schistosomiasis and the dysenteries are of public health importance.

Tuberculosis, although mainly an urban disease, is not confined to the towns. Its prevalence is not definitely known but, in 1947, 1% of the patients admitted to hospital were found to be suffering from the disease. In Khartoum it causes about 7% About 130,000 cases of the venereal diseases are of the deaths. treated annually. Yaws, though now much less common, still occurs in the Southern Sudan. There are about 8,000 known occurs in the Southern Sudan. There are about 8,000 known lepers, i.e., about one in every 1,000 of the population. Leprosy occurs most commonly in the south-western part of the country.

The incidence of sleeping sickness has been much reduced and in 1947 there were only 50 new cases. While there were epidemics of typhus and of cholera in Egypt in recent years, neither disease established itself in the Sudan, although 9 cases of typhus were introduced in 1943 and 11 in 1944. Routine medical inspection of school-children shows that defective vision, trachoma, schistosomiasis and splenomegaly are the conditions most commonly found to require treatment.

Dr. Lorenzen concluded by saying that the use of the new drugs, paladrine, mepacrine, the sulphonamides, the antibiatics, D.D.T. for the destruction of lice and mosquitoes and the economic development of the country-allowing the rapid extension of education and the provision of piped water supplies and electricity in many towns-have together greatly improved the state of the public health in recent years.

A number of questions were then asked by members and the meeting passed a hearty vote of thanks to Dr. Lorenzen for his

The President then installed Dr. Kathleen M. Harding as President of the Branch for the ensuing session and Dr. G. R. Holtby as Hon. Secretary. Dr. Harding, in a few well chosen words, thanked the Branch for the honour bestowed on her. Following this, the members recorded their thanks to Dr. K. F. Alford for the very pleasant and efficient way in which he had led the Branch during his year of office.

The meeting, and subsequently many individual members, also expressed their very great appreciation to Dr. Alison Rae, who is retiring from the office of Hon. Secretary, for the extremely able and delightful manner in which the affairs of the Branch have been conducted throughout the years in which she held this post. The new secretary, after perusing her records and correspondence, feels that the very high standard which she set will be difficult to maintain.

#### MIDLAND BRANCH

President: (1953-4) Dr. Jean M. Mackintosh (Admin. M.O.H. M. & C.W., Birmingham C.B.).

President: (1954-5) Dr. J. Pickup (C.M.O.H., Worcestershire) Hon. Secretary: Dr. W. R. Martine (Admin. M.O.H. Gen. Purposes, Birmingham C.B.).

The fifth meeting of the Session 1953-4 was held at Lancaster Street Welfare Centre, Birmingham, on Thursday, March 4th, 1954, at 3 p.m. Dr. J. M. Mackintosh (President) was in the chair and 26 members attended. Fifteen members of the Midland Tuberculosis Society and six members of the Association of Industrial Medical Officers were also present, by invitation.

#### Social Aspects of Chronic Respiratory Disease

Dr. F. H. Tyrer (West Midlands Gas Board) opened on behalf of the Association of Industrial Medical Officers in place of Dr. Andrew Meiklejohn who had been prevented by illness from giving his paper in person, but had supplied his notes, to which Dr. Tyrer had added some personal observations. He said that there were social influences in every disease, particularly in the chronic. Social cause and social effect interacted to create an ever-widening vicious circle involving the patient, his family and the community. While the individual patient must never be lost sight of, chronic respiratory disease was just another particular public health problem and one in which the emphasis should be upon prevention rather than elaborate treatment and rehabilitation. Mortality was only a partial index of the prevalence of disease-we could not claim that tuberculosis was under control until notification of new cases declined each year as rapidly as the number of deaths. More than half of the present-day notifications were in the age group 15-34. There should be better facilities for sheltered employment and these people must not be regarded as social lepers. The known case was far less dangerous than the unknown, and what he required was medical supervision in employment, such as could be given by the industrirl medical officer who studied the patient in relation to his job, his workmates and his employer. Control might be primarily an outside-the-factory problem but the industrial medical officer could make an important contribution.

Pneumoconiosis was not merely a disease of the coal miner, it occurred in foundries, brickworks, steelworks, potteries and the gas industry. It was common and slight in the Midlands, but in South Wales it was a serious problem, as there were few opportunities there for a change of employment. The affected men were generally highly skilled craftsmen of middle age whom industry could not afford to lose, and a new job meant time to learn and lower pay and status.

Chronic bronchitis was found in 1950 to account for more unemployment in the N.W. than any other physical condition, and an analysis of mortality figures relating to chronic bronchitis had shown that age, sex, social class, degree of urbanisation and atmospheric pollution, living conditions, nutrition, occupation and perhaps smoking were all factors. Too early a return to a dusty occupation after acute respiratory infection might be an important factor in the ultimate development of disabling chronic bronchitis and emphysema. There was need for the Youth Employment Service to pay special attention to the suitable placing of children whose schooling had been interrupted by recurrent respiratory infections since infancy.

Chronic respiratory disease was responsible for a tremendous loss of productive power and imposed a heavy burden upon industry. It created also a heavy demand upon hospital and general medical services, and, while control might be many sided, the occupational health service had a place in such control alongside the preventive and curative services.

Dr. J. E. Geddes (Senior Tuberculosis Officer, Birmingham) made reference to the magnitude of the problem, both clinical and social, created by the patient with chronic (open) pulmonary tuberculosis; problems which had pestered the Tuberculosis Service and the community over many years and which, with the recent reduction in infection and in the overall significance of tuberculosis, become all the more vital. He discussed the incidence of infection in relation to M.R.C. Tuberculin Survey (in 1949-1950) and to the incidence of infection as revealed by recent tuberculin surveys in Birmingham; as the tide of tuberculosis receded the care of those patients with chronic pulmonary tuberculosis became all the more important. The problem had many phases, but that which related to their association with the tuberculin-negative adolescent in industry was not the least important facet of this complex problem.

The number of patients with chronic pulmonary tuberculosis in the community should be carefully assessed and plans for their social, medical and industrial supervision should be constructed with the greatest care. They should not be allowed to ply their habits and their trades indiscriminately. The work of Alice Stewart in Nottingham emphasised the importance of infection in industry, and the wisdom of the recent memorandum from the Ministry regarding the employment of the "open" case in

industry was subject to comment and criticism.

Dr. E. L. M. Millar (Dep. M.O.H., Birmingham) drew attention to the preponderance of chronic bronchitis as a cause of attendance at general practitioners' surgeries, and to its prevalence as the disabling factor on the Disabled Persons' Register. He thought that the long duration of the complaint responsible for its economic significance among the middle aged at what should be their most able and active time of life. Annually 30,000 deaths were associated with chronic bronchitis, and it was significant that, while the mortality rate from pulmonary tuberculosis had decreased 7-fold in the last 100 years, that for chronic bronchitis had not altered appreciably. Was it because this was a degenerative disease, or was it because it was a typical product of English weather and smoky towns? There was certainly a considerable reduction in rural as compared with urban areas. During the London Smog of 1952, there were 4,000 deaths above the normal for the period, mainly in the older age groups, with bronchitis responsible for nine times, and pneumonia for four times, the normal numbers.

By the liaison with the Housing Department in Birmingham, they were able to ensure varying priority in rehousing, depending upon the gravity of the ill health in the applicant's family, with a small quota for urgent rehousing of the most severe cases, and of all the varied medical conditions put forward, they had found chest complaints to be the most prevalent. They had felt moreover, that bronchitics and asthmatics who lived in congested smoky areas and were overcrowded as to sleeping and living accommodation, should always receive a degree of medical priority. They had found, too, that there was a psychological reaction in many such persons closely linked with their unsatis-

factory living conditions.

No less than 367 tuberculous families were rehoused in Birmingham during 1953. Priority was given not only with a view to removing the tuberculous from overcrowded households, but also uninfected families who lived with the tuberculous under similar conditions which were prejudicial to the patient's recovery or to the general family health. A quota set aside each year allowed the T.B. Service virtual power to nominate those most urgently in need, while up to thirty points were allocated in the less se. re. Uninfected families, moreover, living with the tuberculous, were also catered for by the points scheme and an undertaking asked from the tuberculous tenant that he would not sublet again if his sub-tenants were rehoused. There had been a concentration of new cases during 1953 in the central slum areas, especially those scheduled for redevelopment, but the number of new cases arising on the new estates was almost alarming. It might be that re-housing of the tuberculous was responsible, even if 50% of cases are thought to become infected at work. 25% of new notifications occurred in the 15-25 year olds, and Dr. Millar thought that we should tackle the problem from an epidemiological point of view and try to locate the source of infection following notification. Mass miniature radiography could be of more value here in exploring a wide circle of contacts of new cases at home and at work, for the present response from factories, etc., was poor. Let the service be used for fishing in the most likely waters, i.e., among contacts of actual cases.

An interesting discussion followed in which Drs. Gubbins, Starkie, Clayton, Thompson, R. T., McDowall (M.M.R.), Lloyd (Mid. Tuberculosis Society), and Floyd (Industrial M.O.)

After the speakers had replied a vote of thanks was accorded on the motion of Dr. Cohen, seconded by Dr. Tabbush.

The Annual General Meeting was held at Messrs. Triplex Safety Glass Co. Ltd., Eckersall Road, King's Norton, Birmingham 30, on Thursday, July 15th, 1954, at 2.30 p.m. Dr. J. M. Mackintosh (President) was in the chair and 43 members and several guests attended.

Appointment of Officers and Council for the year 1954-55.
The following, having been nominated, were duly elected:
President: Dr. J. W. Pickup.
President-Elect: Dr. F. L. Ker, O.B.E., T.D.
Vice-Presidents: Drs. W. R. Martine, T. M. Clayton, C. Starkie,
H. M. Cohen and J. M. Mackintosh.

Elected Members of Branch Council: Drs. H. Paul, S. W. Savage, C. Cookson, J. F. Galloway, G. M. Fleming, W. A. M. Stewart and J. R. Preston.

Hon. Treasurer: Dr. A. J. B. Griffin. Hon. Secretary: Dr. W. R. Martine. Hon. Auditors: Drs. F. L. Ker. and E. L. M. Millar.

Representatives of Midland Branches, British Medical Associa-tion: Drs. J. A. M. Clark, and W. R. Martine.

Representative from Midland Tuberculosis Society: Dr. A. Gordon Evans.

Representative on Tuberculosis Group of Society: Dr. A. Wilson Russell.

Representative to Midland Tuberculosis Society: Dr. G. M. Fleming.

Representative on City of Birmingham Public Health Classes Advisory Committee: Dr. W. R. Martine.

Representatives on West Midland Special Residential Schools' Standing Committee: Drs. J. W. Pickup, H. M. Cohen, and T. M. Clayton.

Honorary Life Membership. Dr. R. J. Cyriax, who had completed 33 years membership of the Society, was nominated by Dr. Clayton, seconded by Dr. Preston, for Honorary Life Membership. ship; and it was unanimously agreed to submit this nomination to the Society.

Resignation from Branch. A letter from Dr. J. E. Geddes, resigning from the Branch on his acceptance of an appointment in Glasgow, was read, and the Hon. Secretary was instructed to write to Dr. Geddes congratulating him on his appointment,

thanking him for services to the Branch and wishing him every success in his new sphere.

There being no further business, members and friends proceeded to a tour of the Works, prefaced by an introductory talk from Mr. A. G. Rose, Works Director, and a demonstration of the types of safety glass manufactured by the firm.

After a most interesting tour, the members and their friends were entertained to tea by the Directors.

The first meeting of the 1954-55 session was held at Lancaster Street Welfare Centre, Birmingham, on Thursday, October 7th, 1954, at 3 p.m., Dr. J. M. Mackintosh, the retiring President, in the chair. 35 members attended.

Representation on Council of Tuberculosis Group. Dr. R. B. Mayfield, whose nomination had been proposed by Dr. T. M. Galloway, seconded by Dr. R. W. Markham, was appointed as second representative of the Branch.

Amendment of By-law (3). Following upon the recently imposed reduction in Branch representation on the Council of the Society, and consideration by the Branch Council, it was proposed by Dr. Galloway, and seconded by Dr. Preston to amend the existing By-law (3) to read as follows

By-law (3)-" One Representative of the Branch shall be elected annually to serve on the Council of the Society. He/she shall be eligible for re-election unless he/she has been serving in that capacity for the four previous consecutive years. The Hon. Secretary shall, ex officio, act as Deputy Representative unless personally elected as Repre-

This amended By-law was thereupon approved.

Election of Representative on Council of Society. Dr. J. W.

Pickup was elected.

Induction of Dr. J. W. Pickup as President. Dr. Mackintosh, firstly thanked the Branch for the support given to her during her term of office. She then welcomed the new president, Dr. Pickup, and in asking him to take the chair, expressed the good wishes of the Branch to him for a successful and happy year of

Dr. Pickup then thanked Dr. Mackintosh and the Branch and proceeded to deliver his Presidential address (published in Public Health, December, 1954).

Dr. Shennan proposed and Dr. McLachlan seconded a cordial vote of thanks to Dr. Pickup for his inspiring address. This was carried with acclamation.

#### SERVICES GROUP

President: Air Comm. F. E. Lipscombe, O.B.E., Q.H.P.
Hon. Secretary: Dr. H. D. Chalke, O.B.E. (M.O.H., Camberwell Met. B., Divl. M.O., L.C.C.).

A meeting of the Group was held on November 26th, 1954, in the Society's Committee room. Eighteen members were present. A most interesting paper was read by S/Commander G. H. S. Southwell-Saunders, R.M., on "Industrial Health in H.M. Dockyards."

Questions were asked and a discussion followed. The President thanked the speaker for an excellent and most informative address,

which was very much enjoyed.

On January 21st, 1955, the Group met in Committee Room C," B.M.A. House. Twenty-seven members were present.

"C," B.M.A. House. Twenty-seven members were present.

The President read a letter from the President of the Society
that Dr. Charles White be nominated for the Presidency of the Society during the Centenary year 1955-56. The Group endorsed the suggestion unanimously.

The Hon. Secretary reported that the Group had been invited to hold a meeting at the R.A.M. College on February 18th, 1955, by kind permission of the Commandant. The Group had been invited, also, to visit the Army School of Health, Mytchett, where an excellent programme had been arranged by the Commandant, Col. Burke.

**Presidential Address** 

The President then delivered his address on: "Military Hygiene in Transition" (which is to be published in full in the April issue of PUBLIC HEALTH).

A vote of thanks was proposed by Major-General Hilton-

Sargeant, and was carried by acclamation.

#### MATERNITY AND CHILD WELFARE GROUP

President: Dr. Hilda Davis (Sen. M.O. (M. & C.W.) Buckinghamshire).

Hon. Secretary: Dr. Mary Paterson (Sen. M.O., L.C.C.). Hon. Assistant Secretary: Dr. Joyce E. Marshall (M.O., Div. 3., L.C.C.).

#### sent Ideas on Immunisation against Pertussis<sup>3</sup> Diphtheria and Tetanus Present

general meeting was held in the London School of Hygiene and Tropical Medicine, on Friday evening, December 3rd, 1954, at which Dr. J. Ungar, of the Glaxo Laboratories, gave a talk on the above subject. The President was in the chair.

Dr. Ungar spoke first of the efforts to find a reliable antigen against pertussis. Field trials in the U.S.A. and more recently in Britain had shown that successful immunisation against pertussis could be achieved if an effective antigen was used.

The investigation by the M.R.C. published in 1951 was a landmark in the progress towards this goal. The follow up of children for 2½ years, in the immunised and non-immunised groups, with a bacteriological investigation of suspects, gave a statistically significant figure for the difference in the incidence of pertussis in the two groups.

Earlier field trials failed because of the inferior quality of the vaccine. Progress in technical knowledge in the last ten years had altered this. An effective method of estimating the antigenicity of different vaccines had been evolved after some years of intensive research. This will safeguard the high quality of the

Simultaneous immunisation against pertussis, diphtheria and tetanus was shown to be effective by trials in the last decade. It had been accepted as common practice in the U.S.A. and Canada for some time, and more recently there had been an increasing interest in this type of vaccine in Britain. Reports from Columbia University in the last few years had shown that young babies immunised with a diphtheria-pertussis-tetanus vaccine were protected against all three diseases. One advantage lay in the reduction in the number of injections.

The different types of pertussis antigen, and the merits and

demerits of the subcutaneous and intramuscular sites of injection were then described and evaluated. The deep subcutaneous site was recommended for the Glaxo non-alum containing antigen.

The importance of ensuring that the interval between the first and second doses was never less than, and preferably not much more than, four weeks, was emphasised. The date of the third dose should never be less than four weeks later, but might be postponed, if circumstances made this unavoidable, for even two or four months, so long as the interval between the first and second was correct.

The serological immaturity of very young babies, with the resulting low titre of antigenicity after immunisation, was not sufficient argument against early immunisation, because, it had been shown, the sensitisation of the protective mechanism against the pathogenic organism, i.e., the basic immunity, had been achieved. Although some babies had a high degree of passive immunity to diphtheria, the response to a boost dose at 18 months or later of those immunised at three months was the same as that of babies immunised at eight months. There was apparently no passive immunity of maternal origin to pertussis.

It was now accepted that three months was a suitable age for primary immunisation, because of the high mortality rate of pertussis in the first six months of life. The boost should be given between 18 months and two years. The size of the boost as less relevant than the time between it and the primary dose. The value of the boost dose was shown by an investigation at King's College Hospital of a group of nurses, where the Schick positive cases were seen to develop a high antitoxin level as the result of the small quantity of antigen used in the Schick test.

The reaction rate differed with the type of vaccine and the size of the dose. There was an optimum dose of bacteria to provoke an optimum response, and a certain amount of reaction had to be accepted as inevitable if the best result was to be achieved.

The incidence of local and general reactions was then described. In the M.R.C. trial, severe reactions did not occur with the plain vaccine. The incidence of local reactions is about 7% lasting up to 48 hrs. In reference to Professor Bradford Hill's report on the relationship between the type of antigen used and the incidence of Poliomyelitis, it was shown that there was only a very slight risk incurred with the plain vaccine, and that the absorbed vaccines are more prone to cause paralysis in certain cases than any other material used for injections. The W.H.O. recommend that the use of pertussis and diphtheria antigens should only be postponed when there is epidemic Poliomyelitis in that area.

Immunisation should only be carried out in children in good health, not in convalescent or debilitated children, and not till four weeks after small pox vaccination. Where asthma or excema occur, these should have subsided first. There is a slightly increased risk in children who have convulsions, but immunisation should be carried out, as the alternative carries a

greater risk.

In considering the value of tetanus antigen, the annual number of cases of this disease must be born in mind. Antitetanic serum gives far more severe reactions in those not already immunised. The fact of immunisation must be recorded in an available way for each individual.

There is a case for the use of anti-pertussis immune serum if given five to six days after exposure. A test in a group of contacts in an institution has shown its efficacy. The assessment of acquired immunity to pertussis is very difficult.

Slides were then shown to demonstrate the investigations referred to in the lecture, on the optimum mixture of antigens and the proof of the efficacy, indeed, of the enhanced efficacy of

the combined antigen now recommended.

In replying to questions, Dr. Ungar said that it was estimated that 70% of children should be immunised against pertussis in order to achieve abolition of this disease as with diphtheria, but even if this was attained it would have to be maintained. Recent experience of an outbreak of diphtheria in Canada was cited. Further questions followed, to which Dr. Ungar replied.
Dr. Katherine Hirst proposed a vote of thanks which was

warmly applauded.

### Official Announcements

#### KING'S COLLEGE HOSPITAL Denmark Hill, S.E.5.

Applications are invited for the posts of Assistant Physio-THERAPY TEACHER and STUDENT TEACHER. Applicants for the first post should hold T.M.M.G. or T.E.T. certificates.

Applications giving details of age, training and experience together with the names and addresses of two referees should be sent to Miss E. M. Stewart.

Public Health is the Official Organ of the Society of Medical Officers of Health and a suitable medium for the advertisement of official appointments vacant in the health service. Space is also available for a certain number of approved commercial advertisements. Application should be made to the Executive Secretary of the Society, at Tavistock House South, Tavistock Square, W.C.1.

Subscription 31s. 6d. per annum in advance. Single copies 2s. 6d. Official classified advertisements are charged at 3s. 6d. per line or part of a line. Minimum charge 20s.
Telephone: Euston 3923. Telegrams. Epidauros, Westcent.



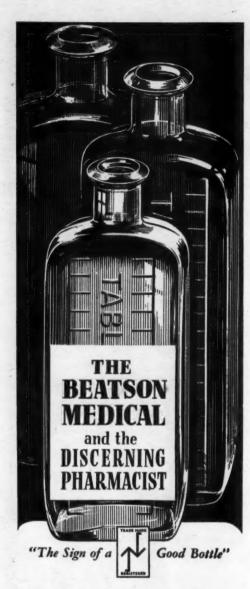
For some youngsters "confined to bed" is all too common a sentence at this time of year. Yet the period of convalescence can be shortened, often considerably, by a reconstructive tonic such as Minadex. By replenishing the blood's reserves of iron and by ensuring an adequate intake of protective vitamins A and D, Minadex staves off fatigue and fortifies resistance to infection through the natural mechanisms. And the cost per patient? On average, about 2d. per day.

# Syrup MINADEX



Mineral and Vitamin Syrup Glaxo

GLAXO LABORATORIES LIMITED, GREENFORD, MIDDLESEX BYROn 3434



Recently developed and of modern design, the BEATSON MEDICAL fits the hand snugly. The vial lip for easy pouring has been retained; sediment can be rapidly dispersed by shaking. With cork mouth or screw neck-white enamelled or black plastic caps.

\* Plain or Graduated Cork Mouth or Screw Capped

BEATSON, CLARK & CO. LTD GLASS BOTTLE MANUFACTURERS ROTHERHAM · Established 1751 · YORKS

NAPT PUBLICATION

# BCG AND VOLE VACCINATION

A PRACTICAL HANDBOOK

#### K. NEVILLE IRVINE

M.A., D.M., B.Ch., M.R.C.S., L.R.C.P. Adviser in B.C.G. Vaccination to Oxford Regional Hospital Board

#### FOREWORD BY FREDERICK HEAF M.A., M.D., F.R.C.P.

David Davis Professor of Tuberculosis The Welsh National School of Medicine

96 pages, comprehensive index, 10 coloured plates, Clothbound Twelve shillings and sixpence

Order direct from:

NATIONAL ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS.

TAVISTOCK HOUSE NORTH, TAVISTOCK SQUARE, LONDON, W.C.1.

From the Government Bookshops

## The Registrar General's **Decennial Supplement** England and Wales 1951

OCCUPATIONAL MORTALITY: PART I

Deaths in 1950 in certain broad groups of occupations related to population figures derived from the 1951 Census one per cent, sample tables.

7s. 6d. (by post 7s. 9d.)

## Measurement of Morbidity

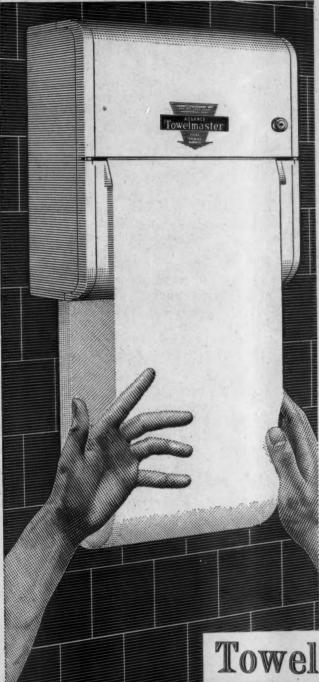
Report of the Statistics Sub-Committee of the Registrar-General's Advisory Committee on Medical Nomenclature and Statistics containing proposals for definitions for the statistical appraisal of sickness,

1s. 6d. (by post 1s. 71d.)

#### HER MAJESTY'S STATIONERY OFFICE

York House, Kingsway, London W.C.2; 423 Oxford Street, London W.1 (Post Orders: P.O. Box 569, London S.E.1); 18a Castle Street, Edinburgh 2; 99 King Street, Manchester 2; 2 Edmund Street, Birmingham 3; 109 St. Mary Street, Cardiff; Tower Lane, Bristol 1; 80 Chichester Street, Belfast;

or through any bookseller.



# A clean soft dry towel for every pair of hands

#### How does the Towelmaster work?

A pull. Here's a length of laundry-fresh towel, enough and to spare for a really good dry. And as you pull, the used portion automatically winds into a separate compartment of the gleaming white Towelmaster cabinet. Nothing more efficient. Nothing more hygienic.

#### How much does the Towelmaster cost?

5/- per roll of towelling. Minimum usage only one roll per cabinet per week. Installation is free. Maintenance is free (two or more cabinets). No charges for replacement. In fact there are no other charges whatsoever.

#### How much is the Towelmaster worth?

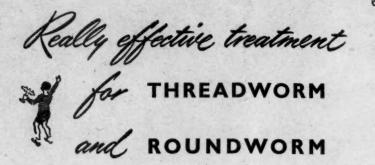
Those few shillings give 180 pairs of hands an honest-to-goodness dry. Benefit staff and visitors alike. Give you 45 yards of goodwill. And what an infinitesimal price to pay for a clean bill of health!

What are your particular needs? We'll be glad to discuss them—without obligation.

ADVANCE

Towelmaster

Advance Linen Service Ltd. (Dept. T40). Stratton House, Piccadilly, London, W.1. Telephone: Mayfair 3886.



'Antepar', the original piperazine elixir, issued as a result of investigations at The Wellcome Laboratories of Tropical Medicine, is already established as a most effective and safe treatment for oxyuriasis.

Trials since undertaken by Wellcome Foundation workers have now demonstrated that in ascariasis a cure rate of more than 90% can be achieved with a single-dose treatment. No side-effects were observed.

'Antepar' is pleasantly flavoured and readily acceptable to small children. It contains piperazine citrate equivalent to 500 mgm. piperazine per fluid drachm, and is available in bottles of 4 fl. oz. and 20 fl. oz.

- Outstanding efficacy
- Rapid and complete cure
- No important side-effects
- Simply administered
- Pleasantly flavoured
- No special routine needed







ELIXIR





víii

BURROUGHS WELLCOME & CO. (The Wellcome Foundation Ltd.) LONDON

ASSOCIATED HOUSES: NEW YORK . MONTREAL . SYDNEY . CAPE TOWN . BOMBAY . BUENOS AIRES . CAIRO . DUBLIN . AUCKLAND